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To: Commissioner for Patents for **Examiner Angel A. Castro** **Group Art Unit 2653**	Facsimile No.: **571/273-8300**
From: Amelia Turner Legal Assistant to Stephen R. Tkacs	No. of Pages Including Cover Sheet: 7
Message: Transmitted herewith: • Transmittal Document; and • Reply Brief.	
Re: Application No.: **09/896,162** Attorney Docket No: **2001-020-TAP**	
Date: Tuesday, January 03, 2006	
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: **Dee**

Serial No.: **09/896,162**

Filed: **June 29, 2001**

For: **Apparatus and Method of Making a Reduced Sensitivity Spin Valve Sensor Apparatus in Which a Flux Carrying Capacity is Increased**

§ Group Art Unit: **2653**
§
§ Examiner: **Castro, Angel A.**
§
§ Attorney Docket No.: **2001-020-TAP**
§

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By: Amelia C. Turner
Amelia C. Turner

TRANSMITTAL DOCUMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:
TRANSMITTED HEREWITH:

- Reply Brief (37 C.F.R. 41.41).

No fees are believed to be required. If, however, any fees are required, I authorize the Commissioner to charge these fees which may be required to Deposit Account No. 19-4545. No extension of time is believed to be necessary. If, however, an extension of time is required, the extension is requested, and I authorize the Commissioner to charge any fees for this extension to Deposit Account No. 19-4545.

Respectfully submitted,

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Docket No. 2001-020-TAP ***PATENT***

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Examiner: **Castro, Angel A.**

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By: Amelia C. Turner
Amelia C. Turner

REPLY BRIEF (37 C.F.R. 41.41)

This Reply Brief is submitted in response to the Examiner's Answer mailed on November 2, 2005.

No fees are believed to be required to file a Reply Brief. Any required petition for extension of time for filing this brief and fees therefore, are dealt with in the accompanying TRANSMITTAL OF REPLY BRIEF.

ARGUMENT

In response to arguments presented in the Appeal Brief with respect to claims 5 and 15, the Examiner's Answer states:

> The Examiner respectfully points out that "a reduced sensitivity spin valve sensor" is a relative term and it is not clarified in the claim with respect to what it has a reduced sensitivity. Furthermore, the claim just present [sic.] two fixed layers and two free layers (not even the non-magnetic layer) without a functional relationship among them that would give a distinguishing characteristic of the spin valve sensor.

As can be seen from the claim, and supported by the thorough description in the specification, the spin valve sensor of the present invention has at least two fixed layers and at least two free layers, wherein the at least two free layers are positioned between the at least two fixed layers and wherein the at least two magnetically fixed layers have a parallel magnetic orientation. It is this configuration that gives the spin valve sensor a reduced sensitivity. Neither of the spin valve sensors of *Gill*, of which there are clearly two, has the claimed configuration. Therefore, neither spin valve sensor of *Gill* has a reduced sensitivity. In fact, the very purpose of the Gill disclosure is to add the signals of the two spin valve sensors, which operate independently, to achieve an **increased** sensitivity. Simply stated, *Gill* fails to anticipate the claimed invention in form and in purpose.

The Examiner's Answer also states:

> Furthermore, it is noted that a dual spin valve sensor is actually two spin valve sensors separated by a non-magnetic layer, the difference being a change in nomenclature (see for example Gill et al (U.S. Pat 5,701,222)).

As the Examiner's Answer correctly states, a dual spin valve sensor is actually two spin valve sensors. This is not merely a difference in nomenclature. *Gill* teaches **two** spin valve sensors and adding the signals together with a differential amplifier to achieve increased sensitivity, while the presently claimed invention is a **single** spin valve sensor with reduced sensitivity. Such distinctions cannot be dismissed as a mere difference in nomenclature.

As an analogy, consider a claim to an automobile that seats eight passengers and travels 10 miles. A reference showing two automobiles that seat four passengers and travel 10 miles each does not anticipate the claim. The end result may be the same (eight passengers travel 10 miles); however, there are certain benefits to achieving the result using a single automobile, such

as less fuel consumption. Besides, the reference simply fails to show a single automobile that seats eight passengers and travels 10 miles. In the instant case, the single spin valve sensor of the present invention achieves a reduced sensitivity. The two spin valve sensors of *Gill* may have their signals added together, but they are still two independent spin valve sensors and they do not achieve the same benefit as the present invention.

Moreover, "a claim preamble has the import that the claim as a whole suggests for it." *Bell Communications Research, Inc. v. Vitalink Communications Corp.*, 55 F.3d 615, 620, 34 USPQ2d 1816, 1820 (Fed. Cir. 1995). "If the claim preamble, when read in the context of the entire claim, recites limitations of the claim, or, if the claim preamble is 'necessary to give life, meaning, and vitality' to the claim, then the claim preamble should be construed as if in the balance of the claim." *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305, 51 USPQ2d 1161, 1165-66 (Fed. Cir. 1999). See also *Jansen v. Rexall Sundown, Inc.*, 342 F.3d 1329, 1333, 68 USPQ2d 1154, 1158 (Fed. Cir. 2003) (In considering the effect of the preamble in a claim directed to a method of treating or preventing pernicious anemia in humans by administering a certain vitamin preparation to "a human in need thereof," the court held that the claims' recitation of a patient or a human "in need" gives life and meaning to the preamble's statement of purpose.). *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951) (A preamble reciting "An abrasive article" was deemed essential to point out the invention defined by claims to an article comprising abrasive grains and a hardened binder and the process of making it. The court stated "it is only by that phrase that it can be known that the subject matter defined by the claims is comprised as an abrasive article. Every union of substances capable *inter alia* of use as abrasive grains and a binder is not an 'abrasive article.'" Therefore, the preamble served to further define the structure of the article produced.). See also *In re Cruciferous Sprout Litig.*, 301 F.3d 1343, 1346-48, 64 USPQ2d 1202, 1204-05 (Fed. Cir. 2002) (A claim at issue was directed to a method of preparing a food rich in glucosinolates wherein cruciferous sprouts are harvested prior to the 2-leaf stage. The court held that the preamble phrase "rich in glucosinolates" helps define the claimed invention, as evidenced by the specification and prosecution history, and thus is a limitation of the claim (although the claim was anticipated by prior art that produced sprouts inherently "rich in glucosinolates")). In the instant case, the claim elements are not merely a bag of parts. To the contrary, the elements in the body of the claims in question are specifically configured to achieve the result of reduced

sensitivity in a single spin valve sensor. *Gill* fails to show the claim elements in a single spin valve sensor and also fails to show a spin valve sensor with reduced sensitivity.

In response to arguments presented in the Appeal Brief with respect to claims 10 and 20, the Examiner's Answer states:

> The Examiner respectfully points out that the magnetic flux is distributed across the two free layers as set forth in the reference to Gill in column 7, line 64 to column 8, line 30 and therefore reduce the magnetic flux fed to each free layer.

The cited portion of Gill is as follows:

> When encountering a magnetic field from a rotating disk, the thicker free layers **178** and **182** will rotate in the same direction. Since the thinner ferromagnetic free layers **176** and **184** are strongly exchange-coupled to the thicker layers **178** and **182**, their magnetic moments **190** and **192** will follow the magnetic moments **186** and **188** respectively. The force of the exchange coupling between the thick and thin layer of each spin valve sensor is on the order of 10,000 Oe. F1 is rigidly antiparallel-coupled to F2 and similarly F3 is rigidly antiparallel-coupled to F4. These layers maintain antiparallel magnetization orientation while responding to magnetic fields. Assuming a magnetic field directed into the paper, the magnetic moment **186** of the second ferromagnetic free layer **178** will rotate into the paper toward saturation, as shown by the arrow **194**. When the magnetic moment **194** of the second ferromagnetic free layer is parallel to the magnetic moment **168** of the pinned layer **156**, the resistance of the spin valve sensor **130** is minimum. The magnetic moment **190** of the ferromagnetic free layer **176** will rotate in an opposite direction to the magnetic moment **186** of the second ferromagnetic free layer **178**, as shown by the arrow **196**. In a like manner, with an applied signal into the paper, the magnetic moment **188** of the third ferromagnetic free layer **182** will rotate into the paper toward saturation, as shown by the arrow **198**. The magnetic moment **192** of the fourth ferromagnetic free layer **184** will rotate out of the paper, as shown by the arrow **200**. Since the magnetic moment **200** of the fourth ferromagnetic free layer is out of the paper, and the magnetic moment **172** of the pinned layer **162** is into the paper, they are antiparallel and the resistance of the spin valve sensor **132** is at a maximum to the sense current. If the field signal from the rotating disk was out of the paper instead of into the paper, the arrows **194**, **196**, **198** and **200** would be reversed in direction.

In this passage, *Gill* explains that free layers **176** and **178** in one spin valve sensor and free layers **182** and **184** in the other spin valve sensor are antiparallel-coupled. Thus, the free layer pairs

give responses of opposite polarity. Because the free layer pairs of the two independent spin valve sensors in *Gill* are positioned between two magnetically fixed layers (rather than each spin valve sensor having at least two free layers positioned between at least two magnetically fixed layers, as in the presently claimed invention), flux is shared between the two spin valve sensors. Therefore, the purpose of the antiferromagnetically (AFM) coupled pairs is to **increase** the sensitivity of each separate spin valve. For small levels of input flux, you would need higher sensitivity spin valves, which are produced in *Gill* with the AFM coupled free layer pairs, especially in their described differential configuration. The portion of *Gill* cited by the Examiner further demonstrates that *Gill* does not anticipate a single **reduced sensitivity** spin valve sensor, each spin valve sensor having two fixed layers.

In view of the above, Appellant respectfully submits that claims 5-7, 9, 10, 15-17, and 19-21 are allowable over the cited prior art and that the application is in condition for allowance. Accordingly, Appellant respectfully requests the Board of Patent Appeals and Interferences to not sustain the rejections set forth in the Final Office Action.

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